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USSR INSTRUMENT FOR CHECKING SCREW PITCH OF ARCHIMEDEAN-TYPE SPIRAL



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An instrument [see appended graphics material, item 17] for use in measurement laboratories is intended for checking the screw pitch of Archimedean-type spirals (for example, in the large gear of three-jaw chucks).

Accuracy of measurement is 0.005-0.008-millimeter; the maximum pitch that can be measured is 20 millimeters. Any pitch size can be measured on the instrument by means of a supplementary tapered rule. The time for resetting the instrument from one pitch size to another is 5-8 minutes, including the time for mounting the part to be checked. The time for checking one item is 2-3 minutes.

A schematic drawing of the instrument is given in Figure 1 [appended]. One of the features of the instrument is the synchronized spindle (9) rotation and carriage (1) reciprocation, without the use of gear trains.

The carriage (1) is actuated by a rigid stop located on a clamp nut which moves along the thread of spindle (9). The spindle, moving with the nut, slides on the sloping surface of a wedge (klin) (10). The carriage, rigidly connected to the arm (11) which carries the wedge (10), receives forward motion.

This arrangement makes it possible to cut to a minimum errors arising from the inaccuracy of the kinematic measuring chain of the instrument, to simplify the design and decrease the cost of manufacturing the instrument, as well as to ensure the accuracy and stability of measuring.

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All units and parts of the instrument are mounted on a rigid bed (8). A spiral disk is rigidly fastened to the spindle (9) by means of interchangeable mandrels or a universal chuck (4). One revolution of the spindle corresponds to the movement of the carriage with the measuring device for one pitch of the disk spiral. The measuring finger (nakonechnik) contacts the flute of the spiral and records the deviation of its pitch. The split nut of the spindle is connected by means of an adjusting screw (6) with the slide block (7) of the spindle. The adjusting device compensates for thread errors in the spindle and nut. The nut with the slide block moves freely in a vertical direction and is in constant contact with the screw of the adjusting device (under spring pressure).

The spindle (9) is rotated by a lever (5) which is connected with a worm device.

A plate, located on the carriage, travels on ways along the carriage by means of a screw pair.

The errors are recorded on graph paper. The strip of graph paper is fastened on the table (2) which is mounted directly on the bed. The pen of the recorder charts the errors in the elements of the spiral being checked. The indicator (3) serves as a visual aid in measuring. The recording device, with a gear ratio of 1:500, records the errors of the Archimedean spiral. An error of 0.002 millimeter in the spiral corresponds to one millimeter of the curve on the chart. The character of the curve determines the pitch error and sum of the spiral pitch as well as the backlash of the spiral in relation to the hole.

Figure 2 [appended] illustrates the charting of errors in pitch and backlash of spiral in relation to the hole.

[Figures follow.]

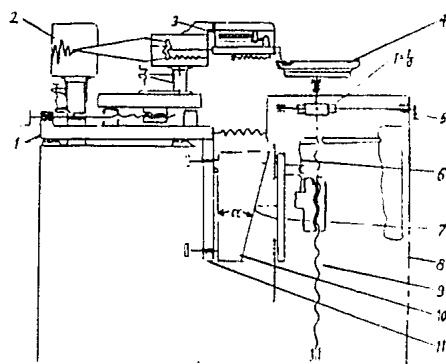


Figure 1

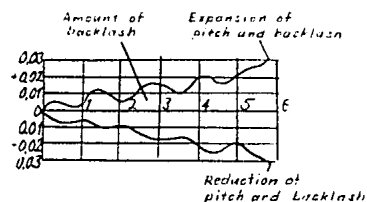


Figure 2

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